

AMENDMENTS TO THE CLAIMS:

Please cancel claim 1, without prejudice or disclaimer of the subject matter therein, amend claims 2, 3, 5, 6, 8, 9, 12, 18, 22, 30, 41, and 49, and add new claims 55-68, as denoted in the following listing. This listing of claims will replace all prior versions and listings of claims in the application:

1. (Canceled)
2. (Currently amended) The method of claim 1 3, further including displaying the characteristic of cleanliness to an operator.
3. (Currently amended) A The method of claim 1 detecting contamination of engine fluid in an engine, further including comprising:
providing engine fluid to a particle counter;
measuring a characteristic of cleanliness of the engine fluid with the particle counter
during operation of operating the engine in a dynamometer test during the stage of measuring the
characteristic of cleanliness of the engine fluid; and
initiating operation of a filtration system coupled to the engine to clean the engine fluid
when the characteristic of cleanliness measured with the particle counter exceeds a threshold
value.
4. (Original) The method of claim 3, further including halting the dynamometer test based on the characteristic of cleanliness of the engine fluid.

5. (Currently amended) The method of claim 4 3, wherein the characteristic of cleanliness is selected from one of a particle count, a particle size, and a rate of particle accumulation.

6. (Currently amended) The method of claim 4 3, wherein the engine fluid is unfiltered.

7. (Previously presented) The method of claim 2, wherein initiating operation of the filtration system includes initiating operation of the filtration system in response to a command received from the operator.

8. (Currently amended) The method of claim 4 3, wherein initiating operation of the filtration system includes initiating operation of the filtration system automatically in response to the characteristic of cleanliness exceeding the threshold value.

9. (Currently amended) A The method of claim 4 detecting contamination of engine fluid in an engine, further including comprising:

providing engine fluid to a particle counter;

measuring a characteristic of cleanliness of the engine fluid with the particle counter during operation of the engine;

initiating operation of a filtration system coupled to the engine to clean the engine fluid when the characteristic of cleanliness measured with the particle counter exceeds a threshold value; and

identifying a characteristic of a quality of build of the engine based on an analysis of the characteristic of the cleanliness of the engine fluid.

10. (Previously presented) The method of claim 9, further including displaying the characteristic of the quality of build to an engine builder.

11. (Previously presented) A method of detecting contamination of engine fluid in an engine, comprising:

providing engine fluid to a particle counter;

measuring a characteristic of cleanliness of the engine fluid with the particle counter during operation of the engine; and

making recommendations to an engine builder based on an analysis of the characteristic of the cleanliness of the engine fluid.

12. (Currently amended) A system for measuring contamination in engine fluid of an engine, comprising:

a source of engine fluid;

a particle counter attached to the source of engine fluid from the engine for measuring a characteristic of cleanliness of the engine fluid;

a drain for draining the engine fluid from the particle counter;

a filtration system in fluid communication with the engine for filtering and returning engine fluid from the engine, wherein the filtration system is initiated when the characteristic of cleanliness measured by the particle counter exceeds a threshold value; and

a computer system for identifying a characteristic of a quality of build of the engine based on an analysis of the characteristic of the cleanliness of the engine fluid.

13. (Previously presented) The system of claim 12, wherein the filtration system is initiated by an operator when the characteristic of cleanliness measured by the particle counter exceeds a threshold value.

14. (Previously presented) The system of claim 12, wherein the filtration system is a kidney loop filtration system.

15. (Previously presented) The system of claim 12, wherein the filtration system further includes:

an external pump for drawing the engine fluid from the engine; and
an external filter through which the pump draws the engine fluid.

16. (Original) The system of claim 12 wherein the particle counter is an optical type particle counter.

17. (Original) The system of claim 12, further including a computer for displaying particle count information, said computer being in communication with the particle counter.

18. (Currently amended) A filtration system for cleaning engine fluid during an engine dynamometer test, comprising:

an external pump for drawing the engine fluid from the engine during the dynamometer test; and

an external filter through which the pump draws the engine fluid.

19. (Previously presented) The filtration system of claim 18, wherein the external filter is placed upstream of the external pump and removes particulate of a first size from the engine fluid.

20. (Previously presented) The filtration system of claim 19, further including a second external filter placed downstream of the external pump, the second external filter removing particulate of a second size, smaller than the first size, from the engine fluid.

21. (Canceled)

22. (Currently amended) A method of detecting contamination in engine fluid and cleaning engine fluid in a running engine, comprising:

measuring characteristics of the cleanliness of the engine fluid during a test cycle in which the engine is run at varying loads; and

variably operating a filtration system based on the varying loads for a first period of time in the test cycle; and

~~operating the filtration system during a second period of time in the test cycle when the characteristics of the cleanliness of the engine fluid reaches a threshold level.~~

23. (Previously presented) The method of claim 22, further comprising halting the running of the engine when a malfunction criteria is met.

24. (Previously presented) The method of claim 23, wherein the malfunction criteria includes a decrease in engine cleanliness over time.

25. (Previously presented) The method of claim 22, wherein the characteristic of cleanliness is selected from one of a particle count, a particle size, and a rate of particle accumulation.

26. (Previously presented) A system for detecting contaminants in engine fluid from a running engine during an engine dynamometer test, comprising:
a filtration system for cleaning the engine fluid, the filtration system having:
an external pump for drawing the engine fluid from the engine; and
an external filter through which the pump draws the engine fluid; and
a particle counter system including an optical particle counter,
wherein information derived from the particle counter system is used to determine a characteristic of cleanliness of the engine fluid during operation of the engine at a plurality of engine loads during the dynamometer test.

27. (Previously presented) In a system having a particle counter and a filtration system, a method of analyzing the health of an engine and cleaning engine fluid during operation of the engine, comprising:
providing engine fluid to a particle counter during a first time period;
operating the particle counter to measure a characteristic of cleanliness of engine fluid in the engine during the first time period; and
initiating operation of the filtration system during the first period if the characteristic of cleanliness measured by the particle counter exceeds a threshold value during the first time period.

28. (Previously presented) The method of claim 27, wherein the characteristic of the cleanliness of the engine fluid is selected from one of a particle count, a particle size, and a rate of particle accumulation.

29. (Canceled)

30. (Currently amended) The method of claim 27, further comprising analyzing the health of the engine based on the characteristic of cleanliness during a the first time period.

31. (Canceled)

32. (Previously presented) A method of analyzing the health of an engine, comprising:

providing engine fluid to a particle counter;

measuring a characteristic of the cleanliness of the engine fluid with the particle counter during operation of the engine;

analyzing the health of the engine based on the characteristic of cleanliness; and

making recommendations to a builder of the engine based on the health of the engine.

33. (Previously presented) The method of claim 27, further comprising:
providing engine fluid to the particle counter during a second time period; and
measuring the characteristic of the cleanliness of the engine fluid with the particle counter during operation of the engine during the second time period.

34. (Previously presented) The method of claim 33, further comprising filtering the engine fluid with the filtration system during the second time period to clean contaminants from the engine fluid.

35. (Original) The method of claim 34, wherein a duration of the second time period is based on a preset time value.

36. (Original) The method of claim 34, wherein a duration of the second time period is based on the characteristic of the cleanliness of the engine.

37. (Original) The method of claim 34, further comprising analyzing the health of the engine based on the characteristic of cleanliness during the second time period.

38. (Original) The method of claim 37, further comprising providing an indication of a malfunctioning engine if the characteristic of cleanliness is a particle count and if the particle count rises above a threshold value over a period of time.

39. (Original) The method of claim 37, further comprising halting the engine if the health of the engine indicates a malfunction.

40. (Previously presented) The method of claim 34, further comprising operating the particle counter without the filtration system during a third time period to monitor the health of the engine after the engine fluid has been cleaned during the second period of time.

41. (Currently amended) A method of detecting engine fluid contamination in an engine, comprising:

varying a load at which the engine is run according to a criteria;
providing engine fluid from the engine to a particle counter while varying the load; and
measuring a characteristic of cleanliness of the engine fluid with the particle counter.

42. (Previously presented) The method of claim 41, further comprising:
activating a filtration system for a latter portion of a first cycle in which the
engine is run at low idle;
activating the filtration system during an initial portion of a second cycle in which
the engine is run at an increased load;
activating the filtration system for a latter portion of a third cycle in which the
engine is run at full speed; and
activating the filtration system during an initial portion of a fourth cycle in which
the engine is run at low idle.

43. (Previously presented) The method of claim 41, wherein varying
the load at which the engine is run includes varying the load during an engine dynamometer test.

44. (Previously presented) The method of claim 40, further comprising
determining when a malfunction criteria is met.

45. (Previously presented) The method of claim 44, wherein the
malfunction criteria includes a decrease in engine cleanliness over time.

46. (Previously presented) The method of claim 44, wherein the
malfunction criteria includes a detection of large particles.

47. (Previously presented) The method of claim 44, wherein the
malfunction criteria includes an increase in particles over time.

48. (Previously presented) The method of claim 44, further comprising halting operation of the engine when the malfunction criteria is met.

49. (Currently amended) The method of claim 43, further comprising determining when a malfunction criteria is met.

50. (Previously presented) The method of claim 49, wherein the malfunction criteria includes a decrease in engine cleanliness over time.

51. (Previously presented) The method of claim 49, wherein the malfunction criteria includes a rapid detection of large particles.

52. (Previously presented) The method of claim 49, further comprising taking corrective action when the malfunction criteria is met.

53. (Previously presented) The method of claim 52, wherein taking corrective action includes halting operation of the engine.

54. (Previously presented) The system of claim 26, wherein the filtration system operates during the dynamometer test based on the plurality of loads at which the engine is operated during the dynamometer test.

55. (New) The method of claim 9, further including displaying the characteristic of cleanliness to an operator.

56. (New) The method of claim 55, wherein initiating operation of the filtration system includes initiating operation of the filtration system in response to a command received from the operator.

57. (New) The method of claim 9, further including halting the dynamometer test based on the characteristic of cleanliness of the engine fluid.

58. (New) The method of claim 9, wherein the characteristic of cleanliness is selected from one of a particle count, a particle size, and a rate of particle accumulation.

59. (New) The method of claim 9, wherein the engine fluid is unfiltered.

60. (New) The method of claim 9, wherein initiating operation of the filtration system includes initiating operation of the filtration system automatically in response to the characteristic of cleanliness exceeding the threshold value.

61. (New) A method of detecting contamination of engine fluid in an engine, comprising:

providing engine fluid to a particle counter;

measuring a characteristic of cleanliness of the engine fluid with the particle counter during operation of the engine; and

identifying a characteristic of a quality of build of the engine based on an analysis of the characteristic of the cleanliness of the engine fluid.

62. (New) The method of claim 61, further including displaying the characteristic of cleanliness to an operator.

63. (New) The method of claim 61, further including operating the engine in a dynamometer test during the stage of measuring the characteristic of cleanliness of the engine fluid.

64. (New) The method of claim 63, further including halting the dynamometer test based on the characteristic of cleanliness of the engine fluid.

65. (New) The method of claim 61, wherein the characteristic of cleanliness is selected from one of a particle count, a particle size, and a rate of particle accumulation.

66. (New) The method of claim 61, wherein the engine fluid is unfiltered.

67. (New) The method of claim 61, further including displaying the characteristic of the quality of build to an engine builder.

68. (New) The method of claim 61, further comprising halting the operation of the engine when a malfunction criteria is met.